Abstracts

120 and 60 GHz monolithic InP-based HEMT diode sub-harmonic mixer

Yon-Lin Kok, Pin-Pin Huang, Huei Wang, B.R. Allen, R. Lai, M. Sholley, T. Gaier and I. Mehdi. "120 and 60 GHz monolithic InP-based HEMT diode sub-harmonic mixer." 1998 MTT-S International Microwave Symposium Digest 98.3 (1998 Vol. III [MWSYM]): 1723-1726.

Monolithic sub-harmonic mixers are designed using two circuit topologies for RF frequencies at 60 and 120 GHz. They are fabricated on a 3-mil thick InP substrate using 0.1 /spl mu/m pseudomorphic InAlAs/InGaAs HEMT process. On-wafer measurements from 110 to 120 GHz at an IF of 7.8 GHz show a minimum conversion loss of 14.3 dB with 8.2 dBm of a subharmonic LO drive. This is the first demonstration of a monolithic HEMT diode sub-harmonic mixer at 120 GHz. The 60 GHz sub-harmonic mixer achieves a minimum conversion loss of less than 12 dB at an LO drive of 13 dBm. The conversion loss dependence on LO drive power and RF frequency are presented. Results indicate that within the band of interest at 120 GHz the mixer performance remains admirable even when LO drive is as little as 5.3 dBm.

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